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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,402	10/20/2003	Peng Zhang	06412 USA	2570
23543	7590	08/02/2005	EXAMINER	
AIR PRODUCTS AND CHEMICALS, INC. PATENT DEPARTMENT 7201 HAMILTON BOULEVARD ALLENTOWN, PA 181951501			CARRILLO, BIBI SHARIDAN	
			ART UNIT	PAPER NUMBER
			1746	

DATE MAILED: 08/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/689,402

Applicant(s)

ZHANG ET AL.

Examiner

Sharidan Carrillo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 20 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-24 and 34-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 and 34-37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 07202005.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 34-36 are rejected under 35 U.S.C. 102(b) as being anticipated by Kakizawa et al. (6310019).

Kakizawa teaches a method of cleaning a semiconductor substrate using a nonionic surfactant and a solvent (ammonia or a primary to tertiary amine, col. 10). Col. 15, Example 1 teaches a cleaning composition comprising a solvent and the nonionic surfactant. Col. 4, formula 3 teaches Formula 1 of claim 34. Col. 7, lines 20-230 teaches the surfactant having a range of 1-10,000 ppm. Col. 1, lines 20-45 teaches using the method to remove particles after a post CMP process. In reference to claims 35-36, refer to Example 2 in col. 16.

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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4. Claims 34-36 are rejected under 35 U.S.C. 102(e) as being anticipated Hsu (US2004/0149309).

Hsu teaches a method of cleaning a semiconductor substrate using a nonionic surfactant (paragraph 18) and a solvent (nonammonium producing strong base and an amide solvent (paragraph 22)). The method can be used to clean residues after a CMP process. Paragraph 10 teaches low k dielectrics. Col. 4, claim 1 teaches 0-5% by weight of a surfactant. Paragraph 25 teaches rinsing with deionized water.

5. Claims 34-36 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhang et al. (US 2004/0029395).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Zhang et al. teach a method of contacting the substrate with a process solution comprising 10-10000 ppm of surfactant having formula I and II. In paragraph 30, the process solution further comprises a solvent. Paragraphs 29 and 42 teach using the solution for post-CMP processes. Paragraph 63 teaches DI water rinse.

6. Claims 34-36 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhang et al. (6641986).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Zhang et al. teach a method of contacting the substrate with a process solution comprising 10-10000 ppm of surfactant having formula I and II. In paragraph 30, the process solution further comprises a solvent. Paragraphs 29 and 42 teach using the solution for post-CMP processes. Paragraph 63 teaches DI water rinse.

Zhang et al. teach a method of treating the substrate with a process solution comprising 10-10000 ppm of surfactant of Formula I and II and a solvent (col. 5, lines 35-40). In reference to a post CMP processed substrate, col. 8, lines 10-12 teaches treating a substrate having a low k dielectric material. Col. 7, lines 50-65 further teaches treating substrates having dielectric materials. The limitations of a post-CMP processed substrate are inherently met since Zhang et al. teach treating substrates having low-k dielectric materials, which are formed as a result of a CMP process. Col. 8, lines 55-60 teaches a rinse stream.

7. Claims 34-36 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhang et al. (US 2004/0053172).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art

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under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Zhang et al. teach a method of contacting the substrate with a process solution comprising 10-10000 ppm of surfactant having formula I and II. In paragraph 30, the process solution further comprises a solvent. Paragraphs 29 and 42 teaches using the solution for post-CMP processes. Paragraph 63 teaches DI water rinse.

Zhang et al. teach a method of treating the substrate with a process solution comprising 10-10000 ppm of a surfactant of Formula 1 and II (paragraphs 22-23) and a solvent (paragraph 26). In reference to a post CMP processed substrate, paragraphs 37-38 teaches treating a substrate having a low-k dielectric material. The limitations of a post-CMP processed substrate are inherently met since Zhang et al. teach treating substrates having low k dielectric materials which are formed as a result of a CMP process. Paragraph 42 teaches rinse stream.

8. Claims 1-5, 7-9 and 11-37 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhang et al. (US 2004/0204328).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in

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the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Zhang et al. teach a method of contacting the substrate with a process solution comprising 10-10000 ppm of surfactant having formula I and II. In paragraph 30, the process solution further comprises a solvent. Paragraphs 29 and 42 teaches using the solution for post-CMP processes. Paragraph 63 teaches DI water rinse.

Zhang et al. teach a method of treating the substrate with a process solution comprising 10-10000 ppm of a surfactant having the formulas I-VII as described in paragraph 22. In reference to post CMP and low-k dielectric film, refer to paragraphs 50 and 52. In reference to claims 2-5, refer to paragraph 50. In reference to claim 7, refer to paragraph 46. In reference to paragraph 8, refer to paragraph 58. In reference to claim 9, refer to paragraph 33. In reference to claims 12-14 and 35-36, refer to paragraphs 58-59. In reference to claims 15-16, refer to paragraphs 34-35. In reference to claims 17-20, refer to paragraph 56. In reference to claims 21-24, refer to paragraph 58. In reference to claim 37, refer to col. 3.

9. Claims 1-5, 7-9, and 11-37 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhang et al. (US 2004/0053800).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in

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the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Zhang et al. teach a method of contacting the substrate with a process solution comprising 10-10000 ppm of surfactant having formulas I-VII as described in col. 3. In reference to post-CMP and low-k dielectric film, refer to paragraphs 56 and 58. In reference to claims 2-5, refer to paragraph 56. In reference to claim 7, refer to paragraph 52. In reference to claim 8, refer to paragraph 64. In reference to claim 9, refer to paragraph 39. In reference to claim 11, refer to col. 5. In reference to claims 12-13, refer to paragraph 64. In reference to claim 14, refer to paragraph 65. In reference to claims 15-16, refer to paragraph 41. In reference to claims 17-20 and 21-24 refer to paragraphs 62 and 64 respectively. In reference to claim 34, refer to paragraphs 43, 56, and 58. In reference to claims 35-36, refer to paragraph 65. In reference to claim 37 refer to paragraph 46.

### ***Response to Arguments***

10. The rejections of the claims as being anticipated and obvious in view of Zhang et al. (US2004/0029396) is withdrawn in view of the submission of the 1.132 Declaration. However, several new grounds of rejections have been made, as presented above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharidan Carrillo whose telephone number is 571-272-1297. The examiner can normally be reached on M-W 6:30-4:00pm, alternating Thursday.




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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Primary Examiner  
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